Emittance Growth in Non-Symmetric Beam Configurations[*], <u>O.A. ANDERSON</u>, LBL - Emittance growth in intense beams due to nonuniformity, mismatch, and misalignment has been analysed by Reiser [1] for the special case of axisymmetry. A more complex problem occurs in cases where a number of discrete beamlets are to be merged into a single focusing channel, for example, in designs for Heavy Ion Fusion drivers or Magnetic Fusion negative-ion systems. Celata et al. [2], assuming the system to be perfectly matched and aligned, analyzed the case of four round beamlets arranged in a square array. We generalize these previous studies and analyse emittance growth in systems that are less symmetric, e.g., four elliptical beamlets not arranged on a square. We include beam systems that are not necessarily matched and where the x and y moments may be unequal. We also include the possibility of initial convergence velocities that may differ in the two planes and allow for misalignment of the beam centre-of-mass position and direction. The analytic results are presented in a simple form.

[1]   M. Reiser, J. Appl. Phys. 70, 1919 (1991).
[2]   C.M. Celata, et al., Proc. 1987 Particle Accel. Conf.